



Aerial view of Wedge 1 (between the white lines), which encompasses approximately 1,000,000 square feet of building space in the area serviced by Corridors 3 and 4. All of the more than 5,000 employees who worked in the wedge have been relocated to leased office space in nearby Rosslyn and Crystal City, or elsewhere in the Pentagon. Demolition and abatement activities have been completed as more than 15 million pounds of debris were removed, including 3 million pounds of asbestos. The Wedge 1 construction contractor is in the process of placing new utilities and building up the interior space. Having begun in late January 1999, this contract is expected to be completed in the spring of 2001. Tenants, however, may begin occupying renovated space late in 2000.

The Pentagon Renovation Program

THE NEED

The Pentagon, designated a National Historic Landmark in 1992, has never undergone a major renovation, and after more than 57 years, renovation is essential in order to meet current health, fire and life safety codes and provide reliable electrical, air conditioning and ventilating services. Absent a major renovation, the building infrastructure will become increasingly unreliable and soon unable to effectively support the headquarters and nerve center of the national military establishment. Major building systems have deteriorated to such an extent that repairs are no longer effective and entire systems need replacement. The presence of asbestos in the ceiling plaster, ventilating ducts, pipes and floor coverings is a hazard that makes repairs or alterations extremely disruptive and expensive.

From 1982 through 1990, the Department of Defense discussed with the General Services Administration (then owner of the building) renovation of the Pentagon and, in the mid 1980's, GSA supported the concept of transferring the building to the DoD.



The Pentagon was constructed in just 16 months, from September 1941 to January 1943, as 15,000 workers labored in three shifts around the clock due to the pressures of wartime. The structure is almost entirely reinforced concrete as steel was preserved for the war effort. The Pentagon has never undergone a major renovation and after 57 years, all its building systems are beyond repair and need complete replacement. Hazardous materials are also prevalent throughout the 29-acre structure and it is minimally accessible for persons with disabilities.

THE TRANSFER

Based on consultation within the Administration and with Congressional Committees, legislation was prepared to transfer the Pentagon from the Administrator of General Services to the Secretary of Defense so that the renovation of the Pentagon could be undertaken.

The Defense Authorization Act of FY 1991 transferred control of the Pentagon Reservation from the Administrator of General Services to the Secretary of Defense. Under the same Act, Congress established the Pentagon Reservation Maintenance Revolving Fund for the expressed intent of renovating the Pentagon. This Act allows the Secretary of Defense to establish rent

rates for the tenants to support the renovation.

THE PROGRAM

In 1990, a Concept Plan for the Pentagon Renovation was approved based on renovating the building in five 1,000,000-gross-square-foot "wedges" with reno-

vation of the basement as a separate endeavor. The plan envisioned the complete removal of all support systems (mechanical, electrical, plumbing) down to the base structure and then construction of all new systems. This full-scale removal is dictated by the wide-spread presence of asbestos throughout the building. Removal of plumbing systems is based on the high probability of catastrophic failure.



Worker installs asbestos ductwork during the original construction effort.



The River Terrace under construction in 1942. Rather than backfilling the entire site, two levels were created below ground to keep the project on schedule.



The River Terrace as it appeared in April 1999. Declared a historical landmark in 1992, the Pentagon has had few changes to its exterior facades.

The Renovation Program provides all new mechanical, electrical and plumbing systems, sprinkler systems, vertical transportation, cable management systems, improvements in fire and life safety systems, and flexible ceiling, lighting and partition systems. The Renovation will also provide accessibility throughout for persons with disabilities. It will preserve historic elements, upgrade food service facilities, construct operation centers, install modern telecommunications support features, comply with energy conservation and environmental requirements, reorganize materials



45,000 cubic yards of material was excavated in the Pentagon's basement to allow for construction of a new lower slab, which cleared the way for an entirely new mezzanine level.

handling and provide safety improvements in vehicular and pedestrian traffic.

The renovation concept for the Pentagon includes, as a first phase, a new Heating and Refrigeration Plant, which has been constructed. In conjunction with construction of the H&RP, a Center Courtyard Utilities Tunnel was constructed. The tunnel houses piping and conduit which will distribute building utilities provided by the new plant.

The second phase of the Program is the renovation of the Basement and Mezzanine which started in September 1994. The third through seventh phases of the



The Pentagon's new Heating & Refrigeration Plant provides steam and chilled water to the Pentagon and Navy Annex (8,000,000 sq. ft. of space) and can operate on fuel oil or natural gas.



The Pentagon Renovation Team works with the DoD disability manager to address issues of concern for persons with disabilities.

program are the five wedges of the building from the first floor to the fifth floor.

These areas have been determined to be the optimum divisions for renovation while continuing

operations. In order to vacate each wedge prior to renovation, tenants will be moved either to nearby leased office space or to space identified within the Pentagon.

STATUS

On December 26, 1996, Deputy Secretary John White directed that the renovation of Wedge 1 begin in January 1998, and that the wedge be vacated by December 1997.

On January 15, 1997, as required by Congress, the Pentagon's Director for Administration and Management certified that the design, construction and installation of (building) equipment would not exceed \$1,118,000,000. In 1999, that amount was augmented to \$1,220,000,000 to accommodate new security initiatives.

The demolition of Wedge 1 began in early January 1998 and the overall renovation is expected to be completed in about 15 years.

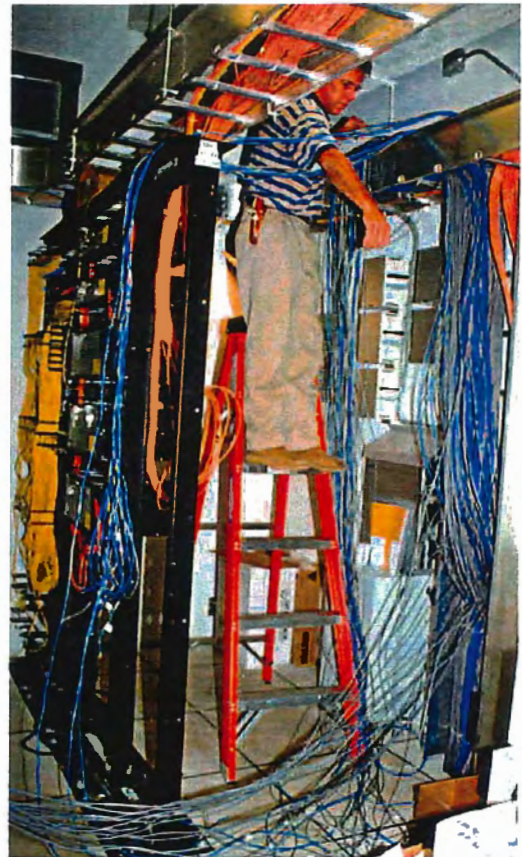
1,200 employees have moved to newly renovated space in the basement and mezzanine.



A ribbon-cutting ceremony in the Air Force Council Room with the Pentagon Renovation Program Manager and the Air Force Chief of Staff.

Right: 16,000 miles of old wiring will be replaced with modern optic fiber, which eventually will carry voice, data and video across one line. Close to 1,000,000 phone calls are made each day from the Pentagon.

A training room inside the new TRICARE clinic. The 50,000-square-foot medical facility consolidates the Army, Navy, Air Force and Civilian clinics in the Pentagon. The state-of-the-art clinic features telemedicine and computer connectivity with physicians throughout the U.S. Radiology features filmless technology. X-rays are digital providing physicians nearly instant feedback. In all, 21 areas of medicine including optometry, trauma care, physical therapy, podiatry, dermatology, cardiology, immunology, pharmacy and others will be provided in the clinic. A new dental clinic includes 30 chairs, compared to the 12 that previously existed in the Pentagon. In most cases, personnel will no longer have to leave the building to receive medical treatment of any kind.



Above: Information Management & Telecommunications personnel inspect design drawings detailing locations of new communication lines below raised flooring.



Pentagon personnel in the new Network Systems Management Center test equipment in the facility, which monitors and provides maintenance for the Pentagon's vast array of computer systems.

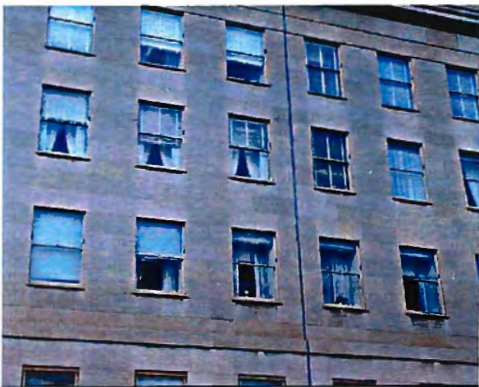
A room inside the Pentagon's new Network Systems Management Center. Among several services, the facility helps to ensure the security of the Pentagon's 25,000 computers and hundreds of local area networks.





Above: Inside the new Heating & Refrigeration Plant's boiler room. The boilers can operate on both fuel oil or natural gas and are significantly more efficient than the coal-fired boilers that existed in the old facility.

Left: Aerial view of the Pentagon's new Heating & Refrigeration Plant (right). The plant is now 100 percent operational and the old facility has been demolished. More than \$1 million has been saved in terms of lower utility costs since the plant became operational in 1997.



All of the Pentagon's 7,748 windows will be replaced with double-paned, double-glazed, thermal-insulated units that will significantly increase the energy efficiency of the building.



Ten chillers in the Pentagon's new Heating & Refrigeration Plant provide enough redundancy to ensure chilled water will continue to feed the building's air conditioning systems. Cooling is critical to the sustained operation of the Pentagon's myriad computer systems.



The Pentagon Renovation Office works closely with the Pentagon Building Management Office, the Pentagon Environmental Management Committee and the Department of Energy to explore alternate sources of energy like the solar panels seen here along the grounds of the new Heating & Refrigeration Plant.



Artist's rendering of the Remote Delivery Facility after completion. Actual completion is expected in the fall of 2000.



Above: The Pentagon's new Remote Delivery Facility will provide a consolidated location for screening all materials and supplies that enter the Pentagon. Trucks and other delivery vehicles will use any of the 38 bays that will line the west side of the facility and will no longer dock adjacent to the Pentagon along the South Terrace.

Right: Aerial view (Feb. 2000) of construction activity at the site of the Remote Delivery Facility near the Pentagon's Mall Terrace.



Above: Near the River Terrace, this new ramp for persons with disabilities marked the first time limestone was added to the Pentagon in 55 years.

Left: The first of two new pedestrian bridges along the Pentagon's South Terrace. The bridge provides safe access to the Pentagon from the South Parking Lot. Two elevators in the bridge provide accessibility for persons with disabilities.

More than 5,000 personnel were relocated from Wedge 1 to swing space in leased office buildings or elsewhere in the Pentagon.



Pentagon senior officials participated in a "Wall-Bashing" ceremony to mark the beginning of demolition inside Wedge 1.

Wedge 1 encompasses 1,000,000 square feet of space. 15 million pounds of debris have been removed and 70 percent of the material has been recycled. Close to four million pounds of asbestos also was removed from the wedge.



Floor slabs have been removed in this area of Wedge 1 revealing all of its five floors and clearing the way for a new escalator bank that will enhance vertical mobility. Renovation also will include installation of 40 new elevators throughout the building.



Debris and hazardous material are removed from the wedge through a temporary hoist mounted adjacent to the building, minimizing disturbance to tenants.



New insulation and windows will improve the Pentagon's thermal envelope and increase energy efficiency.



A demolition crew wears protective gear during removal of one of the Pentagon's 7,748 windows, many of which are tainted with lead-based paint.

Bird's-eye view of the Pentagon (November 1999)



The Pentagon, the nerve center of the U.S. military establishment, can easily be equated to a small city. The building covers 29 acres in addition to a 5-acre center courtyard, and encompasses 6.5 million square feet of building space, equivalent to three Empire State Buildings. The U.S. Capitol could fit into any of the Pentagon's five wedges and employees walk within a maze of 17 1/2 miles of rings and corridors to reach their offices. Surrounding parking lots accommodate more than 10,000 vehicles. The Pentagon also has its own health facilities, post office, mini-mall, fire station, heliport and Metro station. It has and continues to be a symbol of our nation's strength and freedom both here and around the world.

The goals of the Renovation Program are to bring the Pentagon into compliance with all major building codes, the Americans with Disabilities Act, all fire and life safety codes, to preserve its historical integrity, and to ensure that the 25,000 employees that enter its doors each day have a modern, safe and flexible working environment for the next 50 years.



Pentagon Renovation Program

*On Cost, On Schedule,
Built for the Next 50 Years*

*For additional information about the
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or visit our web site at
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